

of leadership only accentuate the considerations already commented on. A pathologist or radiologist who accepts a straight salary, turning the fees from his practice into the school funds, may feel well repaid by the opportunities for research and some relief from the necessity to cultivate a private practice in order to make a living. But what a medical school does must have an influence on what the medical profession will take as acceptable. Schools ought, one would say, to lead as well as to point the way to what is best in the practice of medicine in general.

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NEONATAL MORTALITY IN SAN FRANCISCO*

For the past decade the infant mortality rate in San Francisco has steadily declined. In 1934, the rate dropped to an all-time low of thirty-three per one thousand live births from thirty-nine in 1933, at which point it had been stationary for two years. A slight rise to thirty-five was seen in 1935, and a marked increase to forty-two occurred in 1936, the circumstance surrounding which rise having previously been described.¹

NEONATAL PERIOD USED IN THIS STUDY

In San Francisco, as in other cities, the majority of the infant deaths occur in the neonatal period, which for the purposes of this study was considered under fifteen days. Other factors which vary from year to year influence the total rate, but over a period of ten years the neonatal death rate has been practically stationary. It was with this fact in mind that the present study was undertaken in order to determine, if possible, what factors were present in maintaining the rate level.

* From the office of the Director of Public Health, City and County of San Francisco.

¹ "Infant Mortality in San Francisco," California and Western Medicine, Vol. 47, No. 2 (Aug.), 1937.

Could this rate be reduced or had we reached that theoretical point called the irreducible minimum?

SAN FRANCISCO HOSPITAL FIGURES

It may be of direct interest to point out that the Department of Public Health, through the San Francisco Hospital and its out-patient obstetrical department, delivered in 1933, altogether, 18.2 per cent of the total births that occurred in San Francisco. In 1934, the same agencies delivered 15.5 per cent; in 1935, 14.2 per cent; and in 1936, 11.2 per cent. This reduction is quite remarkable, and is perhaps the most sensitive index to the return of a better economic era.

It could be further pointed out that the ratio of births delivered by these services of the Department of Public Health and the low mortality rate of thirty-three in 1934 may be of some significance. Likewise, the rising infant mortality rate which has occurred in the city and county of San Francisco since 1933 and the decrease in the number of births delivered by the services of the Department of Public Health may be equally significant. It is desired to state, however, that no criticism is intended of the private physician, nor any credit assumed for the excellent record of the departmental services, because it is realized that the pregnant woman, in selecting a physician, quite often materially delays the decision and, in our experience, the private physician does not see the case as early as the out-patient clinic of the Department of Public Health.

For the past six years the out-patient obstetrical service of the Department of Public Health has performed the Wassermann test on all pregnant women coming under its supervision. It may be of additional interest to show that the percentage of positive Wassermann tests has averaged approximately 4 per cent.

NEONATAL DEATHS STUDIED

A total of 231 neonatal deaths occurring between January 1, 1936 and April 30, 1937, were studied. These represent a typical section out of any period in the last decade with reference to the relative

TABLE 1.—*Premature Birth (159*)*

Cause of Death	Autopsy			No Autopsy		
	Male	Female	Total	Male	Female	Total
Prematurity	18	7	25	31	21	52
Atelectasis	13	11	24	8	11	19
Preëclamptic toxemia	--	--	--	0	3	3
Asphyxia	--	--	--	3	0	3
Enteritis-diarrhea	1	1	2	0	2	2
Acute yellow atrophy of liver	--	--	--	0	1	1
Convulsions	--	--	--	0	1	1
Respiratory infections	1	1	2	1	1	2
Hemorrhagic disease new-born	1	0	1	--	--	--
Totals	34	20	54	43	40	83

* International List No., 1930.

TABLE 2.—*Congenital Malformations (157*)*

Cause of Death	Autopsy			No Autopsy		
	Male	Female	Total	Male	Female	Total
Congenital malformations of heart	4	2	6	4	2	6
Atelectasis, asphyxia	1	1	2	0	1	1
Marasmus, enteritis	0	1	1	..	..	..
Bronchopneumonia	1	0	1	..	..	..
Other congenital malformations:	..	..	..	..	..	..
Spina bifida, meningocele	1	0	1	..	..	..
Palate, enlarged thymus	1	0	1	..	..	..
All other malformations	0	3	3	2	3	5
Totals	8	7	15	6	6	12

* International List No., 1930.

incidence of the several classifications. Of the 231 deaths, 132 were males and 99 females. Diagnosis was confirmed by necropsy in 101 instances, or 44 per cent of the total.

CAUSES OF DEATH

The greatest cause of death among the neonatal group is prematurity (Table 1), which was responsible for 137 in this group, of which seventy-seven were males and sixty females, and of which fifty-four, or 39 per cent, came to necropsy. Prematurity as a cause of death is given preference when reported jointly with certain other causes, and Table 1 indicates the joint causes appearing in the group studied. In twenty-five cases that came to necropsy the cause of death is prematurity alone. In twenty-nine other necropsies in the premature group, additional causes were found. The postmortem findings in this group of fifty-four, of course, would have to be reviewed with considerable detail in order to determine what caused the deaths to be diagnosed as premature.

Pathologists themselves are quite willing to admit a certain percentage of unsatisfactory results in this group. Much too frequently they are compelled to rely on the history and the measurements for the diagnosis of prematurity, for the simple reason that prematurity *per se* does not leave any recognizable changes at necropsy; and prematurity is given as the sole cause of death, because no sign of tissue change which would cause death is found. The theory advanced by some that these deaths are physiochemical in character offers a field for investigation which as yet is relatively untouched.

The second important group of neonatal deaths, according to the International Code, is congenital malformations. A total of twenty-seven makes up this group (Table 2), with fourteen males and thirteen females, of which number fifteen, or 55 per cent, came to necropsy. These causes are self-explanatory and require no comment, as, naturally, they originate *in utero*. The relatively high percentage of necropsies in this group is significant,

TABLE 3.—*Injury at Birth (160b*)*

Cause of Death	Autopsy			No Autopsy		
	Male	Female	Total	Male	Female	Total
Injury at birth	0	1	1	--	--	--
Cerebral hemorrhage	2	0	2	--	--	--
Edema of larynx	--	--	--	1	0	1
Asphyxia	--	--	--	3	0	3
Atelectasis	--	--	--	0	1	1
Cerebral hemorrhage	2	2	4	2	3	5
Hemorrhagic disease, asphyxia	--	--	--	0	1	1
Enlarged thymus	1	0	1	1	0	1
Prolonged labor, version delivery, cord prolapse	--	--	--	0	1	1
Tentorial tear	1	0	1	--	--	--
Atelectasis	2	0	2	--	--	--
Breech presentation	1	0	1	--	--	--
Totals	9	3	12	7	6	13

* International List No., 1930

TABLE 4.—Other Causes

Cause of Death	Autopsy			No Autopsy		
	Male	Female	Total	Male	Female	Total
All other causes:						
Atelectasis	1	0	1	1	0	1
Difficult labor	0	1	1	1	1	2
Asphyxia neonatorum	2	1	3	4	1	5
*Gastroenteritis	1	1	2	--	--	--
Bronchopneumonia, otitis media, mastoiditis..	1	0	1	0	1	1
Bronchopneumonia	1	0	1	0	1	1
*Bronchopneumonia	1	2	3	0	2	2
Icterus	1	1	2	1	1	2
*Pneumonia, interstitial, septic infarction lungs..	1	0	1	--	--	--
*Acute tracheitis	--	--	--	0	1	1
Pemphigus neonatorum	--	--	--	2	0	2
Malnutrition	--	--	--	1	0	1
*Acute toxic nephritis, anasarca	0	1	1	--	--	--
*Volvulus, small intestines	1	0	1	--	--	--
Hemorrhagic disease of newborn	1	0	1	--	--	--
*Streptococcic meningitis, predelivery infection of child	0	1	1	--	--	--
*Status lymphaticus	--	--	--	2	0	2
*Streptococcic peritonitis	1	0	1	--	--	--
*Cancer metastatic	--	--	--	0	1	1
Baby did not breathe at birth (lived six hours)	--	--	--	1	0	1
Totals	12	8	20	13	9	22
* Classified outside of diseases peculiar to early infancy (161).						

suggesting the possibility that in the presence of a recognizable abnormality the curiosity of the attending physician is aroused and extra pressure is exerted to secure a necropsy.

The third group classified is one which may lead to considerable misunderstanding. The heading in the International Code (160 B), "Injuries at Birth," lists as a subheading, cerebral hemorrhage directly as a result of injury; also, in the same division, cerebral hemorrhage from any cause whatsoever without reference to injury. Many instances of cerebral hemorrhage are entirely unrelated to trauma as an etiologic factor, and the classification of such deaths under the general heading, "Injuries at Birth," is misleading. In the group studied (Table 3), there were twenty-five deaths, of which sixteen were males and nine females, with twelve necropsies, or 48 per cent. The need for very careful reporting of these deaths, and especially the need for a greater percentage of postmortem studies in this group, is apparent if the present situation is to be clarified.

The fourth group (Table 4) does not follow the International Code classification because there is only one death (occasionally two or three) listed under each cause. Some of these causes come under the heading, "Other Diseases Peculiar to Early Infancy," and others marked (*) have a classification of their own; but, with twenty causes

of death among forty-two deaths, the number in any group is too small to be of significance. Attention is called, however, to the evident fact that those diagnoses without necropsy mean very little from either a statistical or pathological point of view. As in Group 3, there were 48 per cent that came to necropsy.

SUMMARY

1. Neonatal deaths among male infants are more numerous than among female infants in the ratio of approximately 132 to 100. Compared with the birth ratio of 106 to 100, this is an actual as well as a relative high death rate among male infants.

2. A definite need exists for the further investigation by physiochemical studies of the premature infant, both antemortem and postmortem.

3. Except in the premature group, diagnoses without necropsy are always open to question and, if reliable information is to be secured, a greater number of carefully recorded necropsies must be performed.

4. Careful reporting to the local registrar and health officer of the cause of every neonatal death should be the first duty of the physician.

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